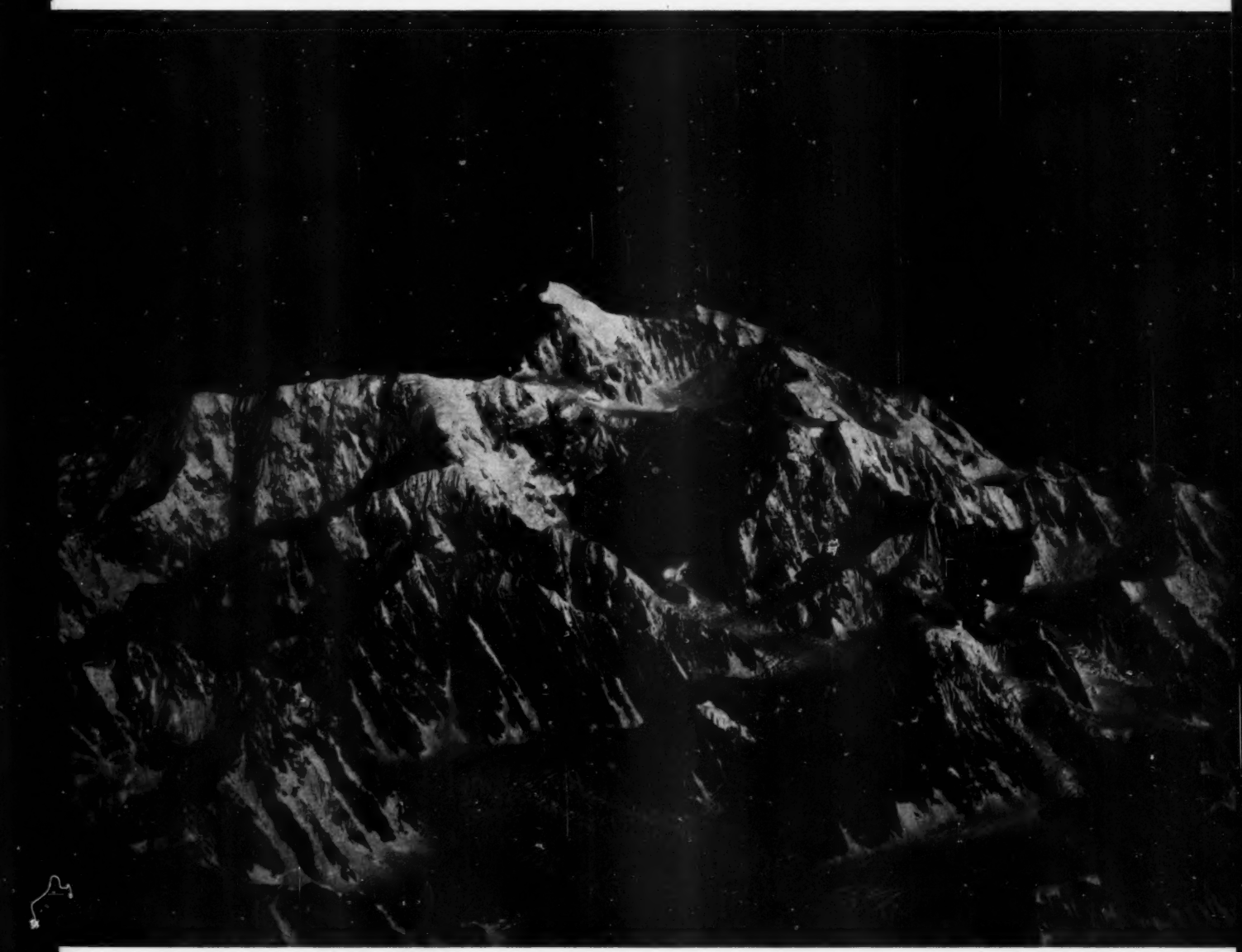
Vol. 3, No. 3 September, 1961

AACE BULLETIN



IN THIS ISSUE: Negotiated Contracts
Predesign Plant Estimation
Boston Convention Recap
1961 Directory Supplement
AACE Election Results

AACE BULLETIN

VOL. 3, No. 3 September, 1961

CONTENTS

Articles

Negotiated Contracts – When and How
R. Custer, L. Root and L. Vining 64

Predesign Estimation of Process Plants
C. J. Keating 67

Departments

Notes from the Editor 62
Message from the President 63
Convention Photos 71
Man of the Moment: John W. Hackney 72
1961 Membership Directory Supplement 74
Constitution and By-Laws 76
AACE Election Results 79

Other Regular Features

Regional Directory and Committee Chairmen 80

Published quarterly by AMERICAN ASSOCIATION OF COST ENGINEERS, Durham, New Hampshire. Single copies, $1.50. Subscription rates: United States and Canada, $5.00 per year; all other countries, $6.00 per year. Printed in the U.S.A.

Copyright, 1961, by AMERICAN ASSOCIATION OF COST ENGINEERS. All rights reserved. This magazine, or any part thereof, may not be reproduced in any form without written permission from the publishers.

EDITOR AND PUBLISHER
Edward D. Shanken

TECHNICAL EDITOR
Roslyn Gitlin

CHAIRMAN, PUBLICATIONS COMMITTEE
James G. Hoyt, General Electric Company
San Jose, California

AMERICAN ASSOCIATION OF COST ENGINEERS
University of New Hampshire
Durham, New Hampshire

OFFICERS

President — Charles R. Hirt, The Procter and Gamble Company, Cincinnati, Ohio
Vice-President — William G. Clark, The Dow Chemical Company, Pittsburg, California
Secretary — Thomas C. Ponder, *Petroleum Refiner*, Houston, Texas
Treasurer — Cecil H. Chilton, *Chemical Engineering*, New York, New York

BOARD OF DIRECTORS

Dr. Bernard J. Gaffney, Wood Conversion Company, St. Paul, Minnesota
William J. Hegerty, The Colonial Iron Works Company, Cleveland, Ohio
Sidney Katell, United States Bureau of Mines, Morgantown, West Virginia
Donald I. Meikle, Meissner Engineers, Incorporated, Chicago, Illinois
Addison W. Seekins, Pittsburgh Plate Glass Company, Pittsburgh, Pennsylvania

Executive Secretary — Edward D. Shanken

Notes from the Editor

Program, turnout, accommodations, weather – all attested to the fact that Boston was wonderful.

We've included in this issue some highlights of convention activities – to show you who couldn't attend what you missed, and to remind those of you who did attend of the fine time we're sure you had.

For the photos of AACE members at work and play we'd like to thank Cecil Chilton, our official photographer.

And for a most stirring talk (abstracted herein), we'd like to thank John Hackney, recipient of this year's Award of Merit. Mr. Hackney's words are not only food for thought for AACE members, but also for all professional people. If you usually do nothing more than quickly scan the *Bulletin* for association news, please make a point, this time, of reading what John Hackney has to say.

With this issue, we've started what I hope will become a regular feature of the *Bulletin* – a brief biography of an AACE member. Appropriately, our first "man of the moment" is John Hackney.

In the future we'd like to introduce to you officers and members, telling you a little more about them than what can be gleaned from a membership directory.

If this idea meets with your approval, please let me hear from you along with any suggestions of members you'd like to see featured in the *Bulletin*

Cover: Mt. McKinley, in Alaska, rises 15,000 ft. above head of Ruth Glacier. Photo taken by Dr. Bradford Washburn, Jr., banquet speaker at Boston Convention, who spoke on his expeditions to and mapping of McKinley.

Message from the President

Charles R. Hirt
The Procter & Gamble Company
President of AACE

Did you enjoy your vacation?

Whether you chose the mountains or the seashore; whether you chose camping or the luxury motels; whether you chose an ambitious tour or a lazy restful stay-at-home vacation, I hope that you and your family had an enjoyable time and you now feel rested and full of vim, vigor and vitality.

Although the conclusion of the vacation period usually means getting back to hard work, it also signals the arrival of cooler weather, end of the grass-cutting period, and other little benefits for which to be thankful. Let's hope that the cooler weather will also bring cooler heads in international tensions, and Khruschev will accept some peaceful solution to clear that "bone in his throat." We've been sitting on a nuclear powder keg for a long time, and it appears that we'll be astride it for a long time into the future. Just hope we won't need to have our Chicago meeting in an underground shelter.

Although our June meeting, in Boston, did not launch anyone into space it was a spacious success. The technical program offered something for everyone, as you know from the last issue of the *Bulletin*. For those of you who were unable to attend this year, subsequent issues of the *Bulletin* will provide you with some of the major technical papers that were presented.

Sorry, but we can't do much to bring you the environs of the full time at the Somerset Hotel. The best I can suggest is for you to relax and conjure up a mental picture of a swim in the hotel pool, outside, with the air at 72°F. and the water at 60°F., . . . and a quiet corner in the lounge sipping a Tiger's Tooth.

As usual, your Board of Directors has been conscientiously working to provide you with sound administration and progress. At the June meeting a number of matters were discussed that will be of interest to you all:

- Recognition was granted to two new regional sections – Montreal, Canada and London, England. Both these areas are very active, and we are particularly happy to welcome these international additions to our official family.
- The Board recommends for your approval two constitutional amendments that will benefit the organization. One rephrases the Objects Section, at the suggestion of legal counsel, so as to meet the requirements necessary for our application to the federal government for tax-exempt status. There is no change in intent, just clarification. The other issue changes the period of office for officers, directors and committee chairmen. The present timing is inefficient with the annual meetings being held in midsummer. The proposed change will be a significant improvement. If approved, the new boards and committees can take over immediately after the annual meetings, and get in a good solid year's work before the succeeding annual meeting. We strongly urge your approval of this change.
- The invitation of the Southern California regional secton was accepted for the annual meeting in 1965. With the rapid growth of membership in this section (and the talent represented) coupled with the climate of Los Angeles, you had better mark your calendar now. This will be a family-oriented meeting and a good opportunity to vacation in the Southwest.

The Organization Manual has suffered some delay, but it is moving forward. It is still scheduled for publication this year. Our application for membership in the Engineers Joint Council is still pending; we have had no word yet of a decision on our application. We are confident that the result will be favorable because of the professional caliber of our membership.

The implications of the U.S. defense buildup, the new highs being reached on the stock market, and the threat of higher taxes and increas-

(*Continued on Page 73*)

Negotiated Contracts — When and How?

Robert Custer, Sun Oil Co., Stephen Root, Badger Mfg. Co.,
Lee Vining, Esso Research and Engineering

In any discussion of negotiated contracts, two major questions arise:

- When is a negotiated contract appropriate? What are the principals involved, advantages and disadvantages, bases for selection of a contractor?
- How are contractual agreements reached? What are the specific procedures followed?

Before we get to the heart of these questions, let's consider some of the basic criteria relating to plant design and construction and then briefly review types of contracts common in the engineering and construction field.

As to plant design and construction, the foremost requirement is that the project, whatever its nature, should comply with the owner's standards of quality and production capacity. It should also be completed within the time schedule established by economic considerations. And it should be constructed for the lowest cost consistent with the preceding factors. Thus, the essential criterion for a contract is that it be the practical business vehicle through which all these requirements may best be met.

Among the basic contractual forms common in the engineering and construction field are cost plus a fixed fee or a percentage fee, fixed price, unit price and target price. Any of these may be the result of negotiations, competitive bid or a combination of each.

A careful evaluation of all pertinent factors should provide a sound basis for accomplishing the goal of compatibility between these options in contract – competitive vs. negotiated alternative – and the specific conditions of each project.

Undoubtedly, the greatest single factor is the degree of scope definition. Where the scope of a project is clearly defined, the competitive bid approach is normally indicated.

At first glance, this appears as the ideal situation. The owner knows what is to be accomplished for the contract price within the scheduled completion date; the contractor works under conditions giving him maximum control of a defined project which he must complete within a set time and for a fixed cost.

On the other hand, one must consider the time spent to define the work and to obtain proposals, cost to several contractors (and ultimately to the owner) of bidding, how developmental changes are handled, owner-contractor relations and many other aspects which need to be recognized before a situation may be termed ideal.

What of the more common situation when scope is in varying degrees of development? A procedure which allows initial planning and preliminary design to proceed concurrently with process development and which also permits a construction start far ahead of complete definition of all phases of scope can provide a significant saving in over-all time for the project.

For example, where the contractor is picked on the basis of reputation or past performance, several months may be saved through eliminating the bidding and bid evaluation period. Additional time savings are possible when the contractor begins working with the owner even prior to the development of scope specifications.

Finally, in the negotiated approach there is the opportunity to select the type of contract and firm the price and schedule at an appropriate time through a definite estimate.

So far, we've stressed the owner's viewpoint. But what is the contractor's position with regard to negotiated work? At first glance this approach appears to be ideal and most such arrangements have been satisfactory. However, profit potential tends to be lower than on competitive work, the number of opportunities to obtain jobs may be fewer. And with the owner as the "controlling partner," the contractor's chances to demonstrate his ingenuity for design and construction economies may be limited.

While obviously not the answer in all circumstances, a negotiated contract may, many times, effectively bridge the gap at the outset of a project when a contracting basis should be established between the inde-

---

This paper was originally presented as a panel discussion at the AACE annual meeting in Boston. Moderator of the panel was Kenneth G. Wolfe, Bechtel Corp. Mr. Custer discussed the "when" of negotiated contracts; Messrs. Root and Vining covered the "how."

terminates of the job and the desire of both owner and contractor to know the final cost and completion date.

With this as background, let's now examine – in more detail – some of the facets of the negotiated contract.

Choosing the Contract

When is a negotiated contract appropriate? What has the owner to gain by seeking a negotiated contract? To answer these questions we must examine several items, i.e., time and status of information.

The effect of delaying the on-stream time of any new process facility should be estimated with great care and impartial judgment. And in his economic study the cost engineer must consider the following:

- What is the relationship of the cost of delaying the on-stream time to pay out? To investment?
- What is the value of reaching the market ahead of competition or ahead of seasonal demand?
- What is the value of money tied up in an uncompleted plant?

Other factors to be evaluated are related to the status of engineering data or development of the specific project. A project which is well defined or where the engineering requirement is open-art quite properly may be subjected to competitive bidding. But what of the project which is little more than a gleam in the owner's eye? How can an owner get the job off the ground when he is limited by a modest engineering department?

The answer to these and many more similar questions is through a negotiated contract. In other words, by establishing an early owner-contractor relationship, we are able to set a course which will eventually satisfy one of the main objectives of our contract – best plant in shortest time.

Time is money. Eliminating the time required of the owner to prepare elaborate bid specifications and the time required of the contractors to estimate and prepare proposals quite often can lead to savings.

Another of the owner's objectives is to get his best plant at the least cost. How can we accomplish this if we've eliminated competition?

But now, assuming that we've been able to justify a negotiated contract, how do we go about selecting our partner for the venture? We select the contractor on the basis of past experience, the contractor's reputation for completing projects on time and within budget, or any other criteria. Lacking any data, we select him by making a quick semi-statistical evaluation of several contractors and analyzing the results.

Such an analysis deals with past experience and contractors' current reservoir of technical manpower. Experience along the lines of our specific project can be measured by a point system:

Item	Points/Project
Design	40
Procurement	10
Construction	20
Pilot Plants	10
Consulting	10
Other	10
	100

Available manpower is measured by:

- Manpower – number of graduate engineers, number of draftsmen
- Contracts – $/yr. (process plants) five-year average
- Current contracts (process plants) $

Table 1 shows how such an analysis might guide an owner in selecting a contractor. Note that the weights assigned to the various experience factors are arbitrary and must be tempered to suit the specific instance. If process know-how was an item of major importance, then perhaps a higher value should have been assigned to pilot plants. In the example we can assume that the owner is providing the process; hence, the relatively low value.

Table 1 – Owner's Guide in Selecting a Contractor

Experience in subject project area (points/project)		Contractors "A"	"B"	"C"	"D"
Design	(40)	240	80	60	160
Procurement	(10)	30	30	10	30
Construction	(20)	80	20	20	60
Pilot Plants	(10)	–	10	–	–
Consulting	(10)	–	10	10	–
Other	(10)	–	30	10	–
		350	180	110	250
Manpower					
Number of graduate engineers		300	480	172	350
Number of draftsmen		200	–	274	235
Contracts, $/yr. (process plants) last five-year average, $MM		92	90	72	125
Cur. contracts (process plants), $MM		76	62	14	85

From /the data provided, it would seem reasonable to eliminate contractors "B" and "C" from any further consideration. Manpower-wise "A" and "D" compare favorably; but "A" has scored heavily in experience. Therefore it would be appropriate to proceed with contractor "A".

Reaching Agreement

In reviewing the procedures by which the owner and contractor reach agreement on a typical contract, let's outline a typical project and the contract and timing involved.

- Project – Typical "grass roots" plant valued at $15-20 million. Completion desired in 18-24 months. Process design by owner, to be complete in eight weeks.
- Contract – A negotiated, cost-plus-a-percentage fee, convertible to a lump sum upon completion of a mutually agreed upon definitive estimate.
- Definitive estimate – Estimate to be complete for review in 16 weeks for process, 18 weeks for offsites and over-all. Owner desires interim cost information for checking purposes, as it is developed.
- Technical specification – This is the basic definition of scope, both for the over-all project and for the estimate. It should cover, in addition to plant description, the basic quality and production capacity standards, expected plant life, safety consideration, local and national codes, any special operation or maintenance requirements.
- Contract terms – The estimate must comply with all terms and conditions of the contract. Provision should be made for cancellation.
- Special requirements – Owner's preference, i.e., a bidders' list for reciprocity or local area contracts.
- Alternate design – The extent of alternate designs to be presented, with costs and economic evaluations for each.

Once the contract has been agreed upon, the owner and contractor next turn to the definitive estimate – responsibilities and procedures:

- Quantities – Independent takeoffs prepared by owner and contractor. Agreed on allowances for incomplete design, wastes, overpours, with special consideration given to piping, access steel, instrumentation, wiring and tubing.
- Major equipment – Bids obtained and evaluated with consideration of engineering detail changes, cancellation charges, delivery schedules and problems, shop tests and inspection.
- Bulk materials – Quotations, discounts on price lists, pipe fabrication rates, delivery and handling must all be jointly studied.
- Labor – Agree on erection procedure and on items to be sub-contracted. Contractor presents his evaluation of manhours for each operation, craft or category of work with rates, fringes and benefits applicable. Owner agrees or cites experience to dispute.
- Field distributables – Contractor presents his plan for field supervision, use of equipment and tools, temporary construction facilities and the relationship of these items to schedule and work operations. Owner evaluates, based on his own experience.
- Offsite charges – Home office engineering, drafting, purchasing, expediting, inspection, legal, cost control, construction management must be presented and jointly reviewed.
- Owner's costs – Any cost items not specifically in contract and reviewed with contractor's estimate must be recognized and evaluated by owner independently. He must consider items such as interest on capital, land acquisition, profit or loss from plant on-stream production as related to project schedule.
- Escalation – Evaluate equipment as quoted, other materials on trend basis. Likewise, escalate labor on basis of previous year's averages, existing long-range agreements and forecast trends.
- Comparisons – Check points are obtained by both parties based on evaluation of past similar projects. This information is normally not exchanged.
- Contingency – Contingency should cover costs anticipated but not specifically pinpointed, estimating takeoffs and pricing errors, engineering omissions and errors, abnormal weather, labor practices. Whether included with the basic estimate or evaluated on an overall basis and shown as a separate item, contingency must be recognized as a real cost item.

Whenever possible conclusions of reviews at the estimator-engineer level (allowing for give and take throughout the estimate), should provide the basis for agreement. This is then presented to the contract negotiators for finalization. In extreme cases of disagreement, respective management groups are called in for arbitration or recourse to other contractual alternatives.

Based on mutual respect and integrity, agreement will normally be reached to the satisfaction of both parties.

Predesign Estimation of Process Plants

Charles J. Keating, National Aniline Div., Allied Chemical Corp., Buffalo, N. Y.

In the U. S. and England (where I spent twelve post-war years), the basic problem of predesign estimating, from the contractor's viewpoint, is essentially the same – to furnish a quick, accurate, economically prepared estimate.

In systematic predesign estimating there are two requirements – basic data and procedural methods. The methods used will depend, to some extent, on the amount of available cost data. Where published data is scarce, estimators must resort to expedients that would not be necessary or permissible if free access to price lists or reliable correlations were available. But the aim is always the same; arrive at the best possible estimate from the information available in the time available.

I have developed evidence of remarkably close cost relationships between different classes of materials for types of plant and capacity. Similar techniques, where background is available, will extract the maximum information from available data and will provide measures of the importance, validity and limitations of that information.

The author is a science graduate of a London technological institute. From 1946 to 1957 he was engaged in structural work for the London offices of Stone & Webster, Foster-Wheeler and Lummus Co. At present he is an assistant estimator in the engineering division of National Aniline in Buffalo.

There are certain compensating advantages in basing preliminary estimates on known prices of particular plant items rather than on generalized graphs. Starting data is closer to reality and at least one knows the source of the information. It is, therefore, always useful to record for future reference every plant cost figure noting type of equipment, capacity, materials of construction, data of quote made and weight. Weight is particularly useful and should be recorded whenever known. For, from it can be derived cost/lb. figures characteristic of the type of equipment, material of construction and class of fabrication.

Stepwise Calculations

For a complete plant, the predesign estimator starts from an engineering flow diagram of the process and a collection of all quotes and cost data which can be obtained.

First he evolves a skeleton plant design specifying, tentatively, the types of equipment and materials of construction, size of vessels, heat transfer surfaces. An important function of this design is to insure that no part of the plant is omitted from the estimate.

The extent of design calculations at this stage will depend upon the time available and the accuracy required; but these need only be approximate. One of the advantages of a composite estimate is that errors in individual items tend to cancel each other so that the percentage error in the total is less than the average error in the items.

Second step in the plan is the estimated cost of each plant item. If prices can be obtained in the minimum time, well and good. If not, full use of prices from past jobs saves time.

Broad principles of estimating on the basis of past jobs are:

- Correct for date by means of a cost index.
- Correct for size by assuming a power relationship between cost and capacity.
- As a check, estimate weight and apply a suitable cost/lb. figure.

At this stage, quick "talking point" figures can be made. And accuracies of from 10-30% of the project cost can result from the firmness of process design. How? By using the total equipment cost (40-60% of direct materials cost), prorating common materials (piping, structures) and prorating labor (by class of material or total). Rough relationships are also obtained to cover site overheads, engineering and home office costs. Such figuring is for economic evaluations and capital appropriations.

A contractor bidding lump sum against cut-throat competition must obtain a closer feel for the cost. How does he economically do this? Aren't there enough influencing variables that creep into every job, e.g., bad weather, craft availability and efficiency, late equipment deliveries, premium time? At least he must make a close ap-

praisal of all within his control. This includes the streamlining and efficient coordination of all engineering design, procurement, construction and accounting functions with emphasis on cost estimating and control. The successful contractor continually collects and correlates all plant costs.

In the face of keen competition, some contractors break the job down into smaller, more convenient units of material and labor. All quantities developed by the various design groups are entered as net quantities on takeoff sheets. Net quantities are then adjusted upward for such items as loss and waste, but not for arbitrary safety factors which would tend to make the estimate needlessly high and consequently less competitive. Also, management must know, as closely as possible, the direct costs of the work to permit them to negotiate as they feel necessary.

This type of estimate is more costly to produce since it involves firm quotations and tabulated bid comparisons on all major equipment, plot plan development and main pipeline layouts. Crash programs of this type require closest coordination and measures for yardstick checking of all involved. With sufficient background, unit costs of material will be as accurate as the material takeoffs allow, but erection costs are the most difficult of all to estimate. They consist chiefly of labor, supervision and overheads – all of which depend primarily on the time which elapses rather than on the amount of work done. Delays in delivery of equipment, faulty organization at the site, local labor efficiency can greatly increase erection cost.

Briefly, let's run through the sections of work involved in compiling a battery limit cost estimate, keeping in mind that all unit figures cited should be considered merely as guides.

Equipment

If time doesn't permit firm quotations, there are many dodges and tricks of the trade for quick estimating of normal, run-of-the-mill process equipment such as pumps, heaters, towers, tubulars, compressors. Table 1 shows a few unit labor costs for erecting and installing equipment.

Site Preparation

Site cost depends largely on the nature of the terrain and the quality of the subsoil. Quantities of excavation backfill, disposal, purchased materials should be entered neat on takeoff sheets by the responsible design groups. To the total, a minimum of 25% should be added by the estimator to compensate for such items as greater excavations made than required, multiple handling of same material, loss or waste purchased material.

The 25% figure may be increased in certain cases, depending upon the accuracy and completeness of the neat quantity tally sheets. Unit costs are applied to cover machine and hand, dirt or rock excavation with consideration for unusual conditions.

Concrete

Preliminary foundation design is prepared for main equipment only. Concrete required for the complete job can be broken down into the following groups: conventional formed concrete at grade, slabs and spread footings, formed walls at grade, superstructures (formed), superstructures (precast), sewer boxes, pipe supports

Table 1 – **Labor Costs for Erecting and Installing Equipment**

Vessels	Bubble Columns	
	using mobile equipment	8-12 man-hr./ton
	using gin poles	25-50 man-hr./ton
	(Man-hr. for erecting heavy vessels with gin poles include for setting, rigging and dismantling pulleys as well as actual hoists into poles.)	
	Trays	
	over 36 in. dia.	1.2-2 M/sq. ft.
	under 36 in. dia.	2.4-4 M/sq. ft.
Compressors		25-50 M/ton
	Drivers (large)	.06-.08 M/hp.
Heat exchangers		
	Shell and tube	8-12 man-hr./ton
	Extruded surface sections	8-12 man-hr./ton
Pump and base plate		
	Range: 5 hp. to 200 hp.	4-0.6 man-hr./hp.
Pump drivers	5 hp. to 200 hp.	4-0.1 man-hr./hp.
Electric generators		40-80 man-hr./ton
Fired heaters		
	Shop assembled, field erected	7-10% material cost
	Field erected only	20-25% material cost

(precast), electrical envelope, grouting. After summating, the estimator should add a minimum of 10% to compensate for overpours, loss and waste.

In developing unit costs, material (gravel, sand, cement) costs should be checked out, approximately, for the particular area of location. An extra 10-30% should then be added to material and labor costs for adverse conditions.

Some contractors break down types of concrete design into many more divisions and develop separate yardage prices for mass concrete, lumber, steel, anchor bolts to arrive at total material costs. They also separate labor unit figures for form and strip, form and rebar, pour and finish. For process plant work with total foundation costs in the order of 3-6% of total directs, I believe that this detailing is cumbersome, more effort producing and certainly no more accurate.

Piping

For process plant work, piping is often as high as 30% of total direct costs.

Although there are many ways of estimating this account, let's deal here with a method used by the contractor preparing an estimate from piping specifications, flow sheets and plot plans:

- Prepare a line list – both process and utility – indicating piping specifications.
- Prepare piping layouts and isometrics (if initially agreed upon).
- List lines individually on appropriate tally sheet and develop material takeoff requirements. Quantities should be added neat, with no "pad" included. Totals will be run for like items, with the estimator covering such items as waste, loss, things known to be excluded from the count. Naturally, the percent to be added is subject to considerable judgment. Checks will be made to see whether fitting frequencies are in line with past experience.
- Develop weights of pipe, fittings and valves by class and diameter inch welding. Time is saved by having purchasing department price material at the same time that engineering department calculates weights and welding.
- Factor bolts, gaskets, screwed fittings (which are generally not counted) from other items.

When taking off steam tracing material, count straight feet only and factor to obtain total material cost. Total material will be from 2-5 times cost of straight pipe or tubing.

If we assume that the piping will be all field shop fabrication, attendent costs would include receipt of raw material, job storage, handling materials to field fabricating shop, moving completed spools and materials to actual installation, field welding and testing. A unit cost/ton is used for these operations; a cost/dia. inch of welding.

This method has its limitations, but is the most satisfactory to suit the haste of the operation.

Insulation

Quantities and type of insulation are normally based on subcontracts as quoted by insulation applicators. The ratio of labor to totalled installed cost of insulation normally runs between 40-50%.

Instrumentation

Instruments can vary quite considerably. They depend entirely on the standards of the industry for the kind of installation as well as the degree of automatic control required.

Instrument prices are prepared by the instrument engineer; labor unit costs, by the estimator. Labor costs range from 10-15% of instrument material cost; control panels range from $40-60/lineal foot. For pneumatic control systems, instrument piping materials and labor costs each range as high as 15% of instrument costs.

Electrical

In compiling electrical requirements, the electrical engineer must have a complete description of power supply, costs and all pertinent details to make an intelligent choice of control equipment and motors. Labor unit costs are applied by the electrical engineer and/or estimator.

Buildings

Time spent on estimating building costs depends on the type of plant. For oil refinery units, building costs can be developed fairly accurately based on such items as square foot of area for control rooms, electric substations, equipment shelters, pump and compressor buildings.

Structural Steel

Design groups prepare preliminary design of steel structures and develop neat quantities. After summating, the estimator adds a minimum of 10% to compensate for miscellaneous bolts, clips, steel shape substitution, loss in cutting, waste.

Material and labor unit costs are applied for small frames, large structures, overhead pipe supports, ladders and platforms, floor coverings, stairways.

Painting

Effort in determining paint-

ing costs should be confined to the magnitude of the costs – less than 1% of total direct material and labor.

A quick and accurate estimate of painting labor is 6-10% of labor cost used to install equipment, piping, building, structural steel. This is based on color coding of piping and equipment. (Factors are also included to adjust for painting not required on insulated surfaces of vessels and aluminum-jacketed piping.) Painting material costs range from 25-35% of labor.

After direct material and labor totals have been compiled, contingencies are added – 2-5% for material; 5-10%, for labor.

Field Indirect Costs

The four broad categories in this section are payroll burdens, insurance and taxes; field office supervision and expense; construction equipment; temporary construction facilities. Initial cost figures developed would be as a percentage of direct labor, the contractor logically contending that this represents a closer relationship than using a percentage of total direct material and labor cost.

With total direct and indirect costs summed up, the next step is a study of areas where costs might be more closely estimated. This includes such intangibles as job conditions and craft efficiencies. Experience and background will determine provisions to be made for location adjustment. Here is one example.

A contractor will prepare the estimate as though work were to be done, say, in the Buffalo area. Depending on craft distribution, labor efficiency = 1.00; over-all average wage rate = 2.80-3.20.

If we assume a proposed job in, for example, South Carolina, we must determine the average wage rate and inject the labor efficiency for that area. Direct labor, estimated in Buffalo, turns out to be $500,000.

If average rate is 2.50 and labor efficiency is 0.80, then:

S.C. labor =

$$\$500{,}000 \times \frac{2.50}{3.00} \times \frac{1.0}{0.8} = \$520{,}000$$

Location adjustment:

$520,000 – 500,000 = $20,000

Therefore add $20,000 to direct labor costs.

Figures are illustrative and not intended to apply necessarily to locations shown.

Payroll burdens, workmans compensation, unemployment insurance, all risk insurance, vacation pay, benefit and trust funds total a percentage of labor which differs from state to state. (In Canada, where I've had some experience, this figure ranges from 7.8% in Manitoba to 14.5% in Saskatchewan.)

Field office supervision and expense can be prorated as a percentage, but a check-study roughing out craft peaks and crews is also necessary.

Construction equipment costs are high for small contracts, firming out to 15-20% of direct labor costs for process plant labor contracts over $500,000. A good superintendent can, with construction ingenuity and careful planning, realize considerable savings. For example, he can purchase and resell certain equipment like welding machines if 9-10 months' work is foreseen. He can also buy reconditioned equipment and employ a master mechanic to maintain and start up equipment before use.

Temporary construction facilities vary from 4-8% of direct labor and include all items that will not become a permanent part of the finished plant – e.g., buildings, utilities.

Engineering

Engineering and home office costs can vary as much as 24-50% of direct labor costs, depending on the type of job and organization.

A large single factor in lowering engineering costs is a strong drawing office handling complete mechanical, piping and civil designs. The project engineer, with part-time help of process, electrical and instrument engineers, handles the complete unit – interpretation of material balance flow sheets, client requirements, development of equipment and material specification, check and approval of all designs, follow-through on purchasing and expediting. All this cannot be achieved unless departmental functions are geared for this type of operation.

Looking for his best price, the contractor can develop the number of piping and equipment drawings required from the plot plan, flow sheets and rough piping layouts. And using factors from past experience, he can determine the number of other drawings needed. The contractor will not, however, set his various design groups in motion until engineering flow sheets, plot plan and specifications are finalized. For later changes, once the design groups have been set up, snowball additional effort and cost.

Soon after he receives the job the contractor, making full use of the detail prepared for the estimate, can quickly assign a large staff to the work and place orders for main equipment and materials.

AACE CONVENTION – BOSTON, 1961

MEMBERS AT WORK . . .

O. Zimmerman

A. Seekins, E. Shanken, W. Hegerty

H. DeLamater, C. Hirt, B. Fefferman

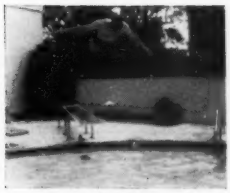
H. Thorne, Jr.

E. Keachie

. . . AND AT PLAY

Coffee Break

Ladies Program



R. Dennee

R. Norden, C. Hirt, T. Roche, R. Dennee

Dr. and Mrs. B. Gaffney and son with guest

Man of the Moment: John W. Hackney

John W. Hackney
Recipient 1961 AACE
Award of Merit

John Hackney, 1961 recipient of AACE's Award of Merit is a travelling man – or so a look at his vocation and avocation would seem to indicate.

That travel has played a major part in the professional life of a man who, in 25 years, worked for but two firms might seem a little strange. But not if we realize that the 22 moves the Hackneys have made in that time were a result of the varied jobs in which he's been engaged since his graduation from Carnegie Tech in 1934. In that year he received his B.S. in Civil Engineering and subsequently (1935, 1946) received his M.S. and C.E. degrees from his alma mater.

Mr. Hackney joined the Aluminum Co. of America in 1935, starting in the hydroelectric department where he was mainly concerned with economic feasibility studies. In 1940, he headed up sewer and water supply design for a series of major aluminum reduction plants. And in the following year he was made construction superintendent in charge of the $18 million aluminum reduction plant at Burlington, N.J. Since there was a copper shortage at the time, the plant contained $86 million worth of silver busbar, borrowed from the U. S. Treasury.

Later work for Alcoa was on such varied projects as construction of employee housing (Oregon) fluoride contamination (California and Oregon). In talking about the latter and its detrimental effect on cattle and trees, Mr. Hackney tells us that he got quite an education in animal husbandry and agriculture, since the solution to the problem involved team work on the part of land agents, dairymen, chemists, engineers.

In 1946, Mr. Hackney was, as he puts it, "traded off" to the Diamond Alkali Co. while his boss and the head of Diamond Alkali were playing golf. He was put in charge of construction of Diamond's $18 million grass-roots chlorine-caustic plant at Deer Park, Texas, where, in addition to construction, he was responsible for cutting out brush, chasing out cattle and snakes. In succeeding years, he became responsible for capital cost estimating and economic analysis as well as Diamond's construction activities.

In 1959, Mr. Hackney moved to Montreal where he was engaged in technical phases of management consulting work and presented a series of seminars covering work in the economic field. In 1961, he joined M. W. Kellogg Co. as a consultant in operations administration – estimating, scheduling, operating procedures.

Mr. Hackney's articles have appeared in *Chemical Engineering, Power, Cost Engineering Quarterly, Petroleum Refiner, Construction Methods, Proceedings of ASCE.* He is a member of the Engineering Institute of Canada, fellow of the ASCE, founding member and past president of AACE, a founder of AACE's Cleveland section, president of the AACE Montreal section during its formation.

As mentioned earlier, John Hackney is a travelling man. And this carries over into his hobbies. For, aside from golf, his main interest is the collecting of early journals of travel and exploration, e.g., Parkman's Journal on which his Oregon Trail book was based and De Soto's letters to the king of Spain.

At present, the Hackneys – John; his wife, Crissie; daughters Barbara, 21, and Linda, 18 – make their home in Scarsdale, N. Y.

Award Acceptance Speech

"It is a humbling but gratifying experience to have been chosen from among this elite group as one qualified to receive such an honor. It is equally gratifying to be joined with the distin-

guished group of previous recipients – men who have contributed in outstandng ways to the advancement of the art and science of cost engineering.

But rather than dwell on the matter, or reviewing the past developments of the AACE in which I am so proud to have served, I would like to take these few minutes to throw out a special challenge to cost engineers for the future – to outline an area of cost work almost untouched, and yet of overwhelming importance to us as professional engineers and to the whole democratic system as we know it.

One of the prime organizational challenges of today is to efficiently conceive, develop and execute the large and ever-increasing complex research, engineering and construction projects which are resulting from the explosive growth of our technology and our population. The difficulties of the organizational problems are apparent in every newspaper and technical journal you pick up.

Our technology seems to have outrun our capacity to organize. What has been added is extreme technical specialization, a need for highly trained professionals, specializing in ever-narrowing fields and the growth of the number of these special fields in geometric progression. And each of these sub-sub-specialities must be handled by a professional – a trained man, with pride in his work, for whom his specialty is an important, interesting subject worthy of the devotion of his working hours and often the devotion of his hours after work.

We know that how this specialist and his associated specialists perform is important. The ability of this nation to live in the style to which it would like to become accustomed rests squarely on the shoulders of the technologist – the man who adds his small, but solid, improvement to the vast coral reef of technical knowledge. This individual professional man can do a good job or a poor one, he can produce results rapidly or slowly.

Organization of these professionals, and control of time and money for operations involving large groups of them, is difficult. But the real, significant results have almost invariably been produced by individuals who for some reason, inbred or inspired by example, have done good work in their own particular sphere because they wanted to do good work. Often they have produced these results in spite of, rather than because of the organization purporting to aid them with its procedural paraphernalia.

Imagine the results if the number of such motivated individuals can be increased – and the further results if they can be motivated in a common direction – so that their influence combines like the oriented molecules in an iron magnet. Or imagine the reverse conditions if we permit top-side bureaucratic control to further stifle the power of these individuals, or if lack of common direction of effort cancels out the effect of those who cannot be stifled.

I submit that the key to energizing the individual power of the professional, as well as the collective, magnet-like power of a group of such professionals, lies in the goals and objectives of the individual professional man.

And we, as cost engineers, find a challenge and a responsibility in providing means of establishing such goals for individuals or, where more practical, for small groups of individuals. We have done much work in clarifying the goals and objectives of larger corporate units. Profitability goals for such units are much clearer for our efforts in this direction, and the corporations have benefited by it. Now we need to subdivide these goals – to find significant units of measurement for smaller units, yardsticks against which small units or even individuals can measure progress significantly.

When such goals are properly set, they lead to a common purpose. Given the proper measuring devices, the individual units can be self-controlling, self-coordinating, self-motivating. The need for topside, dictatorial control will be reduced. The productivity and dignity of the individual will be enhanced.

Fragmentation of goals to fit individual units of an organization is not easy. It is more difficult than setting goals for larger units. But the challenge to cost engineers is there. You and your fellow professional engineers will be the first to benefit. The benefits to others are obvious."

President's Message (Continued from page 63)

ing inflation continue to make the task of the cost engineer more important. We must all rise to the challenge and meet our obligations to our employers, our communities and our country. We must do our part and do our best. For as Thoreau wrote, "So high as a tree aspires to grow, so high will it find an atmosphere suited to it."

SUPPLEMENT

1961 Directory

American Association of Cost Engineers

The following pages contain the names, the positions and/or official titles, the professional addresses and the preferred mailing addresses of active Members, Associate Members and Student Members from May 15 to August 15, 1961.

This membership list is the property of AACE and is not to be used for advertising or soliciting purposes without written permission of the Executive Secretary.

The entries are necessarily brief, but they reflect as accurately as possible the information provided by the members on their 1961 Dues Transmittal Form. The American Association of Cost Engineers cannot be held responsible for errors or irregularities. Every means has been taken to secure accurate information and to prevent errors. The Office of the Executive Secretary will welcome your note on errors, omissions or additions. Future editions of the *AACE Bulletin* will include listings of newly elected members as well as inactive members who activate their membership.

Note: When only the business address is given this is the preferred mailing address. If two addresses are given the last address i.e. home address is the preferred mailing address. When a person is also a member of a Regional Section this is indicated in parenthesis after his listing, i.e. B — British; CM — Chicago Midwest; DV — Delaware Valley; GC — Gulf Coast; M — Montreal; NY — Metropolitan New York; NE — New England; NF — Niagara Frontier; NO — Northeast Ohio; P — Pittsburgh; SF — San Francisco; SC — Southern California. Unless otherwise indicated, i.e., (Associate), all listings are of the grade: Member. Founding and Charter members are so designated.

ADAMS, JOHN T., Cost Engineer, Costs & Estimating Sect.-Construction, Tennessee Valley Authority, 406 Arnstein Bldg., Knoxville, Tenn.

AGARWAL, DR. JAGDISH C. (Founder), Research Technologist, Raw Materials Engineering Dept., Applied Research Lab., U. S. Steel Corp., Monroeville, Pa.

ALEXANDER, HOWARD R. (Charter), Director, Economic Analysis, Product Planning Dept., Mead Johnson & Co., 2404 Pennsylvania St., Evansville 21, Ind.

ALLGAIER, JOHN, Field Supt., Foster Wheeler Corp., 666 Fifth Ave., New York 19, N. Y.

ANDREWS, JAMES H., Construction Cost Examiner, Underwriting Sect., Federal Housing Administration. Merchandise Mart, Chicago 54, Ill. 9737 South Lowe Ave., Chicago 28, Ill.

ARIES, DR. ROBERT S. (Charter), Consulting Engineer, Aries Associates, Boite Postale 24, Chatelaine, Geneva, Switzerland.

ARWAS, JACK S., Chief Estimator, Estimating & Cost Control Dept., Fertilizers & Chemicals Ltd., Haifa, Israel.

BACHMAN, JAMES, Asst. Cost Engineer, Power Development Div., Quebec Hydro-Electric Commission, 107 Craig St., West, Montreal, Quebec. 213-13 Stanford Village, Stanford, Calif.

BLAKELY, MATTHEW L., Executive Vice President, Edwin Moss & Son, Inc., 555 Grant St., Bridgeport, Conn.

BOYCE, WALTER J., Project Engineer, Project Engineering Dept., B. F. Goodrich Chemical Co., 3135 Euclid Ave., Cleveland 15, Ohio. (NO)

CHAMBERLAIN, EUGENE W., Sr. Estimator, Estimating Dept., Bechtel Corp., 485 Lexington Ave., N. Y. 17, N. Y. 195 North Village Avenue, Rockville Centre, N. Y.

CONSORTI, THOMAS P., President, Contractural Dept., Veteran Pipe Covering Co., Inc., 313 East 6th St., New York 3, N. Y.

CURWEN, KENNETH M., Chief Engineer, Central Engineering Dept., Albright & Wilson (Mfg.) Ltd., P. O. Box No. 3, Oldbury, Birmingham, England. (B)

DALY, HARRY, Mechanical Estimator, Estimating Dept., Burns & Roe, Inc., 320 Fulton Ave., Hempstead, N. Y.

DAVIES, W. T. J., Proposal Engineer, Project Engineering Dept., Kellogg International Corp., Kellogg House, 7-10 Chandos St., London W. 1, England.

DONALDSON, J. J., Valuation Engineer, Comptrollers Dept., Phillips Petroleum Co., Adams Bldg., Bartlesville, Okla. 2089 South Dewey St., Bartlesville, Okla.

DOOLITTLE, ALBERT W., Sr. Cost Engineer, Construction & Estimating Dept., Jackson & Moreland, Inc., 31 St. James Ave., Boston 16, Mass.

DWORETZKY, ALAN H., Engineering Development Dept., General Foods Research Center, 555 South Broadway, Tarrytown, N. Y.

ECKENBERG, WILLIAM G., Estimator-Engineer, Engineering Dept., E. I. Du-Pont de Nemours Co., Louviers Bldg., Newark, Del.

EDMUNDS, JAMES L., Engineer, Central Engineering Dept., Sinclair Refining Co., 410 East Sibley Blvd., Harvey, Ill.

EDWARDS, J. S., Administrative & Cost Engineer, Engineering Dept., AviSun Corp., 1345 Chestnut St., Philadelphia 7, Pa.

EISNER, MURRAY E., Mgr. Cost and Estimating Dept., Western Machinery Co., 650 5th St., San Francisco 7, Calif.

ELLSWORTH, RICHARD D., Vice Pres., Charles F. Campbell, Inc., 1100 East Warrington Ave., Pittsburgh 10, Pa.

ENHOLM, ERIC R., Construction Supervisor, Engineering Dept., City of St. Petersburg, Fla. 1746-18th Ave. North, St. Petersburg, Fla.

EVANS, DANIEL G., Project Leader, Chemical Engineering Dept., Atlas Powder Co., Wilmington 99, Del. 228 Waverly Rd., Wilmington 3, Del.

FIELD, CROSBY (Charter), President, Flakice Corp., 360 Furman St., Brooklyn 1, N. Y.

FOX, LYLE E., Mgr., Facilities Engineering, Planning Dept., Amcel Propulsion, Inc., 522 Fifth Ave., New York 36, N. Y.

FREEMAN, O. WILLIAM, Assessment Evaluator. Treasury, Local Property Tax Bureau. State of New Jersey, 314 East State St., Trenton, N. J.

GOOD, GERALD M., Chief Estimator, Estimating Dept., AETRON Div. Aerojet Gen. Corp., 410 N. Citrus Ave., Covina, Calif.

GRAHAM, FRANKLIN D., (Associate), Graham Realty & Appraisal Co., Junction City, Wis. Box 181, Route 4, Mosinee, Wis.

GRANT, WALTER W. (Associate), General Contractor, Walter W. Grant Co., 3018 Mission St., San Francisco, Calif.

GROSSMAN, EDWARD, Engineer, 25 Huntington Ave., Boston 16, Mass.

HAESKE, DON C., Research Chemical Engineer, Polymer Service Lab., U. S. Industrial Chemicals Co., Route 36, Tuscola, Ill. 700 East Barker St., Tuscola, Ill.

HEGERTY, WILLIAM J., Exec. Vice Pres., The Colonial Iron Works Co., 17643 St. Clair Ave., Cleveland 10, Ohio. (NO)

HILL, NEWTON R. (Associate), Estimator, Estimating Dept., Porter Engineering Co., Main St. & Overbrook, Hatfield, Pa. (DV)

HORN, JAMES L., Cost Engineer, Cost Engineering Dept., Stearns-Roger Mfg. Co., 660 Bannock St., Denver. Colo. 2120 Garland St., Lakewood, Colo.

HUBBELL, E. J., Vice Pres., Estimating Dept., Schrader Iron Works, Inc., 1247 Harrison St., San Francisco 3, Calif.

JACKSON, JOHN S., Special Contracts Officer, Business & Finance Dept., Carnegie Institute of Technology, Administration Hall, Pittsburgh 13, Pa. Wexford Run Rd., RD 2, Wexford, Pa.

JIM, HARVEY, Process Economics Engineer, Development Dept., Canadian Chemical Co., Ltd., 1600 Dorchester Blvd., West, Montreal 25, Canada.

KEMNER, FLOYD W., Sr. Estimator, Cost Engineering Dept., The Ralph M. Parsons Co., 617 West Seventh St., Los Angeles, Calif. 9724 Guatemala, Downey, Calif.

KILDEA, JOHN, Process Engineer, Mfg.-Process Div., Gulf Oil Corp., 722 Gulf Bldg., Pittsburgh 19, Pa. (P)

KITSON, FORREST G., Jr., Chief Engineer, Mid Continent Div., The Fluor Corp., Ltd., 3137 Old Spanish Trail, Houston 21, Texas.

KNOX, WILLIAM, Jr., Cost Engineer, Engineering Dept., Gen. Chemical Div., Allied Chemical Corp., 1100 Line St., Camden 3, N. J. (DV)

LADIN, EUGENE, Assoc. Cost Engineer, Cost Analysis Dept., The RAND Corp., 1700 Main St., Santa Monica, Calif.

LANGEFELD, CARL W. (Charter), Associate Engineer, Project Engineering Dept., Merck & Co., Inc., Rahway, N. J.

LENNIE, MAGNUS F. (Associate), Accountant, Richard Costain (Construction) Ltd., 111 Westminster Bridge Rd., London, S. E. 1, England.

LEPELEY, MME. J. B. (Associate), Ingenieur Chimiste, Library — Documentation Dept., Societe Nationale des Petroles d'Aquitaine, 16, cours Albert Ler, Paris 8, France.

LEVENSON, JOHN J. Jr., Chemical Consultant, Carter & Nansen Co., Inc., 420 Lexington Ave., New York 17, N. Y.

LOSHINSKY, HORACE C., Estimating Correlator, Project Development Div., Dorr-Oliver, Inc., Havemeyer Lane, Stamford, Conn. 54 West North St., Stamford, Conn.

MacPHERSON, DUNCAN M. (Associate), Estimator, Pricing & Estimating Dept., Atomic International, Div. of N.A.A., 8900 DeSoto, Canoga Park, Calif.

MAZELIS, BRUNO P., Sr. Estimating Engineer, Costs & Records Dept., The Cleveland Electric Illuminating Co., 55 Public Square, Cleveland 13, Ohio. 19771 Renwood Ave., Euclid 19, Ohio. (NO)

MILES, JOHN V., Chief Estimator, Sales Dept., Head Wrightson Processes, Ltd., 20-24 Old St., London E. C. 1, England.

MILLER, ALEXANDER S. (Associate), Engineering Assistant "A", Engineering Administration Canadair Ltd., P. O. Box 6087, Montreal, P.Q., Canada. 7133-19th Avenue, Laval West, P.Q., Canada.

MILLER, ROBERT S. (Associate), Engineer, Miller Engineering Co., 17-19 Bartlett St., Everett 49, Mass.

MITCHELL, MICHAEL B., Designer, Engineering Dept., Boeing Airplane Co., Renton, Wash. 119 "J" St., N. E., Auburn, Wash.

MOORE, FRED C. (Associate), Project Estimator, Estimating Dept., Catalytic Construction Co., P. O. Box A, Warren Air Force Base, Cheyenne, Wyo.

MORGAN, JAMES P., Process Engineer, Research & Development Dept., Jones & Laughlin Steel Corp., 900 Agnew Rd., Pittsburgh 30, Pa.

MYERS, THOMAS B. Jr., Estimator-Supervisor, Engineering & Construction Div., Koppers Co., Inc., Koppers Bldg., Pittsburgh 19, Pa. (P)

NATKIN, ALVIN M. (Charter), Chemical Engineer, Marketing, Economics & Research Dept., Esso Standard Oil Co., 15 West 51st St., New York 19, N. Y. 1281 Diane Drive, Seaford, N. Y.

NEFSKE, DONALD J. (Student Member), 13010 Algonac, Detroit 5, Mich.

O'CONNOR, ROBERT E., Estimator, Lamp Division, General Electric Co., Nela Park, Cleveland, Ohio. 2109 Stillman Rd., Cleveland 18, Ohio.

O'NEIL, EDWARD J., Estimating Dept., Bldg. & Civil Engineering, Richard Costain (Construction) Ltd. 111 Westminster Bridge Rd., London, S. E. 1, England.

PAYNE, WILLIAM A., Vice President, William E. Terry & Co., Inc., 441 Hall Building, Little Rock, Ark.

PENNELL, DONN F., Budget, Finance & Purchasing, Plant Service, Lawrence Radiation Lab., Berkeley 4, Calif.

PIKAAR, DR. MAARTEN J. (Associate), Estimating Dept., Air Products Ltd., 49-50 Poland St., London, W.I., England. (B)

POWER, JAMES L., Chief Engineer, Homer Knost Construction Co., Inc., P. O. Box 1415, Baton Rouge, La.

PUTNAM, AMOS W. (Associate), Estimating Engineer, Estimating Dept., Humphreys & Glasgow Ltd., 22 Carlisle Place, London S. W. 1, England. Meadow House, Cornsland, Brentwood, Essex, England. (B)

QUILLAN, JOHN T., Appraiser, Walter R. Kuehnel & Co., 22 West Monroe St., Chicago 3, Ill. 6707 Cregier Ave., Chicago 49, Ill.

REESE, FRANK E., Cost Estimator, Engineering Dept., Emery Industries, Inc., 4900 Este Ave., Cincinnati 32, Ohio.

RIELEY, HARLAN D., Chief, Construction & Valuation Sect., Loan Guaranty Div., Veterans Administration, 211 West Campbell Ave., Roanoke, Va.

RITTER, ERIC, Sr. Estimator, Estimating Dept., Catalytic Construction Co., 1528 Walnut St., Philadelphia, Pa. 211 Cobalt Ridge Drive South, Levittown, Pa.

ROBINSON, CLYDE R., Estimator-Engineer, Engineering APED, General Electric Co., 2151 South First St., San Jose, Calif. 1143 White Oak Rd., Campbell, Calif.

ROTH, EDWARD J., Engineer, Premier Oil Refining Co. of Tex., Div. Western Natural Gas Co., P. O. Box 1508, Fort Worth, Texas.

ROYLANCE, C. S., (Associate), Chief Estimator, Coke Oven Dept., Simon-Carves Ltd., Cheadle Heath, Stockport, Cheshire, England.

SCHROEDER, ELMER F., Sr. Engineering Specialist, Project Engineering Dept., B. F. Goodrich Chemical Co., 3135 Euclid Ave., Cleveland, Ohio. 442 Bates Rd., Bay Village, Ohio.

SCHWENDE, CARL, Estimator, Engineering Div., Canadian Vickers Ltd., P.O. Box 550, Place D'Armes, Montreal, P.Q., Canada, 170 Blvd. Goineau Pont-Viau P.Q., Montreal, Canada.

SEIDEL, IRWIN L., (Associate), Cost Analyst, Cost Evaluation Branch, Electronics System Div. USAF, L. G. Hanscom Field, Bedford, Mass. Lot 45 Irene St., Burlington, Mass.

SHINN, GEORGE C., Specification Engineer, Estimating Dept. — AETRON Div., Aerojet — General Corp., 401 North Citrus Ave., Covina, Calif. 821 East Grand Blvd., Corono, Calif. (SC)

SIEBERT, EDMOND A. Jr., (Associate), Vice Pres., Project Control & Sales Dept., Meissner Engineers, Inc., 300 West Washington St., Chicago 6, Ill.

SILVERBURGH, GEORGE, Construction Engineer, House Inspection Service, George Silverburgh, Inc., 10 Wellwyn, Rd., Great Neck, N. Y.

SKOGLUND, STANLEY A. (Associate), Cost Engineer, Central Engineering Dept., Wood Conversion Co., Cloquet, Minn.

SMITH, EDWARD F., Sr. Estimator, Estimating Dept., Holmes & Narver, Inc., 828 So. Fiqueroa St., Los Angeles, Calif. 11600 Dilling St., N. Hollywood, Calif.

SMITH, W. G., Estimator, Engineering Dept., Fisons Ltd., Harvest House, Felixstowe, Suffolk, England.

SOEDER, ALFRED M., Sr. Estimator, Oil Estimating Dept., Arthur G. McKee & Co., 2300 Chester Ave., Cleveland 1, Ohio.

STALLWORTHY, ERNEST A., Manufacturing Eco. & Services (CMF/1), Bataafse, Internationale Chemie Maatschappij N.V., Carel V. Bylandtlaan 23, The Hague, Holland. Barnsteenhorst 348, The Hague, Holland.

STAUDT, WARREN E., Asst. Economic Evaluation Engineer, Development Appraisal Dept., Atlas Powder Co., Wilmington 99, Del. 2409 Maple Ave., The Cedars, Wilmington 8, Del.

STEINKE, JOHN J., Mgr., Proposal & Estimating, Engineering Dept., Lummus Co., Haynes Ave., Newark, N. J.

SUBER, MICHAEL J., (Associate), Process Engineer, Carborundum Metals Co., Box 1278, Parkersburg, W. Va.

SURTEES, NORMAN F., Cost Engineer, Cost Engineering Dept., Reserve Mining Co., Silver Bay, Minn. 15 Field Rd., Silver Bay, Minn.

VALSIK, DONALD J., Mgr., Commercial Research, Research & Development Dept., Wood Conversion Co., First National Bank Bldg., St. Paul 1, Minn.

VOSBURGH, JAMES C. (Charter), Research Engineer, Engineering Development Center, The Lummus Co., 146 Haynes Ave., Newark 5, N. J.

VROMAN, LAWRENCE H. Jr., (Associate), Project Engineer, Construction Dept., Meissner Engineers, Inc., 300 W. Washington St., Chicago 6, Ill. (CM)

WEBB, WILBUR J., Estimator, Central Pricing & Estimating Dept., Atomics International Co., 8900 DeSoto St., Canoga Park, Calif.

WELLS, ARTHUR S. Jr., Economic Evaluations, Standard Cost & Analysis, Tennessee Eastman Co., Kingsport, Tenn. 1573 Greenfield Ave., Kingsport, Tenn.

WERNER, GEORGE, 742 Winslow Drive, Yuba City, Calif.

WHITE, JACK W., Engineer, Plant Engineering Dept., Celanese Corp. of America P. O. Box 937, Pampa, Texas.

YEE, NGIN Y. (Associate), Building Estimator, Building Division, Perini Corp., 73 Mt. Wayte Ave., Framingham, Mass. 208 Arlington St., Framingham, Mass.

YOUNG, THOMAS P., Sr. Estimator, Estimating Dept., Bechtel Corp., 485 Lexington Ave., New York 17, N. Y.

ZONA, PETER G., President, Engineering & Management Co., 19 West 44th St., New York 36, N. Y. 40-19 67th St., Woodside 77, N. Y.

GEOGRAPHICAL INDEX* UNITED STATES OF AMERICA

CALIFORNIA
James Bachman
Murray E. Eisner
Walter W. Grant
E. J. Hubbell
Floyd W. Kemner
Eugene Ladin
Donn F. Pennell
Duncan M. MacPherson
Clyde R. Robinson
George C. Shinn
Edward F. Smith
Wilbur J. Webb
George Werner

COLORADO
James L. Horn

CONNECTICUT
Horace C. Loshinsky

DELAWARE
William G. Eckenberg
Daniel G. Evans
Warren E. Staudt

FLORIDA
Eric R. Enholm

ILLINOIS
James H. Andrews
James L. Edmunds
Don C. Haeske
John T. Quillan
Edmond A. Siebert, Jr.
Lawrence H. Vroman, Jr.

INDIANA
Howard R. Alexander

LOUISIANA
James L. Power

MASSACHUSETTS
Albert W. Doolittle
Edward Grossman
Robert S. Miller
Ngin Y. Yee

MICHIGAN
Donald J. Nefske

MINNESOTA
Stanley A. Skoglund
Norman F. Surtees
Donald J. Valsvik

NEW JERSEY
O. William Freeman
William Knox, Jr.
Carl W. Langefeld
John J. Steinke
James C. Vosburgh

NEW YORK
John Allgaier
Thomas P. Consorti
Harry Daly
Alan H. Dworetzky
Crosby Field
Lyle E. Fox
John J. Levenson, Jr.
Alvin M. Natkin
George Silverburgh
Thomas P. Young
Peter G. Zona

OHIO
Walter J. Boyce
William J. Hegerty
Bruno P. Mazelis
Frank E. Reese
Elmer F. Schroeder
Alfred M. Soeder

OKLAHOMA
J. J. Donaldson

PENNSYLVANIA
Dr. Jagdish C. Agarwal
J. S. Edwards
Richard D. Ellsworth
Newton R. Hill
John S. Jackson
John Kildea
James P. Morgan
Thomas B. Myers, Jr.
Eric Ritter

TENNESSEE
John T. Adams

TEXAS
Forrest G. Kitson, Jr.
Edward J. Roth
Jack W. White

VIRGINIA
Harlan D. Rieley

WASHINGTON
Michael B. Mitchell

WEST VIRGINIA
Michael J. Suber

WYOMING
Fred C. Moore

OTHER COUNTRIES

CANADA
Harvey Jim
Carl Schwende

FRANCE
J. B. Lepeley

ENGLAND
W. T. J. Davies
Kenneth M. Curwen
Magnus F. Lennie
John V. Miles
Edward J. O'Neil
Dr. Maarten J. Pikaar
Amos W. Putnam
C. S. Roylance

ISRAEL
Jack S. Arwas

SWITZERLAND
Robert S. Aries

* According to preferred address in instances of an interstate commute.

AMERICAN ASSOCIATION OF COST ENGINEERS

Constitution and By-Laws

Adopted June 2, 1956

University of New Hampshire, Durham, New Hampshire

Amended September 21, 1961

CONSTITUTION

ARTICLE I. — NAME AND DEFINITION

Section 1. The name of this organization is **AMERICAN ASSOCIATION OF COST ENGINEERS** and its abbreviated title is **AACE.**

Section 2. Cost Engineering is defined as the application of scientific principles and techniques to problems of cost estimation, cost control, and profitability.

ARTICLE II. — OBJECTS

Section 1. To promote through education and scientific means the science of Cost Engineering for the public good.

Section 2. To advance the science and art of Cost Engineering.

Section 3. To provide forums and media through which experiences with the principles and techniques of Cost Engineering may be reported, discussed, and published in furtherance of the public interest.

Section 4. To promote standardization of terminology in Cost Engineering and so far as practicable develop standard methods.

Section 5. To encourage the inclusion of Cost Engineering instruction in engineering curricula in furtherance of our primary object.

Section 6. To cooperate with other organizations having common or related objects, in furtherance of the public interest.

ARTICLE III. — MEMBERSHIP

Section 1. The membership shall consist of Members, Associate Members and Student Members.

Section 2. Admission to membership shall be upon approval of application duly made, and in accordance with procedures established by the Board of Directors and embodied in the By-Laws.

Section 3. A Member shall be an individual who is engaged in Cost Engineering and meets one of the following requirements: (a) is a graduate of a recognized engineering curriculum and has at least five years of experience in a responsible position; (b) holds a license to practice Professional Engineering; (c) has had at least ten years of experience in the engineering profession, at least seven of which were in a responsible position.

A Member has the privilege of holding office, voting for Officers and Directors and voting on changes to the Constitution and By-Laws.

Section 4. An Associate Member shall be an individual who is interested in Cost Engineering but who is not otherwise qualified to be a Member.
An Associate Member has all the privileges and prerogatives of a Member except that he cannot hold elective office or vote on changes to the Constitution and By-Laws.

Section 5. A Student Member shall be an engineering student regularly enrolled in a college or university.

A Student Member has no voting privileges and cannot hold elective office.

ARTICLE IV. — OFFICERS AND BOARD OF DIRECTORS

Section 1 The Officers of the Association shall be a President, a Vice-President, a Secretary, and a Treasurer.

Section 2. The governing body of the Association shall be a Board of Directors, hereinafter called the Board, in which the government and management of the Association is vested, except as otherwise provided for in the Constitution and By-Laws.

Section 3. The Board shall consist of the President, the Vice-President, the most recent Past President, the Secretary, the Treasurer, and four Directors elected at large from the Association.

Section 4. A quorum of the Board shall consist of five members of the Board.

Section 5. The Board shall employ an Executive Secretary who may or may not hold membership in the Association, and may provide him with assistants and equipment. The Executive Secretary shall perform such duties as the Board may direct, and shall render regular reports to the Board regarding his activities.

Section 6. All Officers and Directors shall be Members of the Association and shall be elected by Members and Associate Members.

Section 7. The term of office shall be nominally one year for Officers and nominally two years for Directors-at-Large, the exact duration being determined by the interval between successive annual meetings.

Section 8. All Officers and Directors shall take office five days after the close of the Annual Meeting following their election.

Section 9. Two Directors-at-Large shall be elected each year.

Section 10. Vacancies occurring in the offices of Vice-President, Secretary, or Treasurer, or among the Directors-at-Large shall be filled by vote of the Board for any unexpired portion of the term.

Section 11. If the office of President becomes vacant, the Vice-President shall become President.

Section 12. The President, Vice-President, and Directors-at-Large shall not be eligible to serve two successive terms in the same office unless the first term was not a full term.

Section 13. The Secretary and the Treasurer shall be eligible to serve any number of successive terms to which they are elected.

Section 14. Nominations of Officers and Directors-at-Large shall be made by a Nominating Committee, although nominations may also be made by Members and Associate Members as prescribed in the By-Laws.

Section 15. Election of Officers and Directors shall be by ballot as prescribed in the By-Laws.

ARTICLE V. — COMMITTEES

Section 1. The Committees of the Association shall consist of Standing Committees as prescribed in the By-Laws, Technical Committees, and a Nominating Committee whose function is to select a slate of candidates for the various offices to be filled annually.

Section 2. The President, with the approval of the Board, may appoint temporary committees for special assignments.

ARTICLE VI. — MEETINGS

Section 1. There shall be an Annual Meeting of the Association held between the dates of May 1 and September 30. The Board shall fix the time and place of the annual meeting.

Section 2. Other meetings of the Association shall be determined by the Board as prescribed in the By-Laws.

ARTICLE VII. — REGIONAL SECTIONS

Section 1. Regional Sections, composed of Association members of all classifications in good standing, may be established by the Board of Directors upon suitable evidence of interest by membership in the respective area.

Section 2. The function of the Regional Sections shall be to further the objectives of the Association through closer personal relationships at the regional level.

ARTICLE VIII. — AMENDMENTS

Section 1. The Constitution may be amended by letter ballot as prescribed in the By-Laws.

Section 2. An affirmative vote of three-fourths of the valid votes cast shall be required for adoption of an Amendment.

BY-LAWS

ARTICLE I. — MEMBERSHIP

Section 1. All applications for membership shall be accompanied by remittance of annual dues and shall be forwarded to the Executive Secretary who shall submit them to the Admissions Committee. Membership shall become effective upon affirmative vote of two thirds of the Admissions Committee.

Section 2. Members who fail to pay their dues within one hundred twenty days after statements are rendered are automatically transferred to inactive status and lose all rights and privileges of membership.

Section 3. A member whose membership has lapsed because of non-payment of dues may be restored to membership by subscribing to the Constitution and By-Laws and paying in full annual dues for the year in which his membership lapsed and for the year in which he requests reinstatement.

Section 4. A member in good standing may resign by submitting his resignation in writing to the Executive Secretary.

Section 5. A member who has resigned in good standing may be restored to membership by paying dues for the year in which he requests reinstatement.

Section 6. An Associate Member who wishes to apply for the grade of Member must submit an application as provided for in Section 1, but if his current dues are paid his application shall not be accompanied by remittance of dues.

Section 7. A Student Member may retain that status until the end of the calendar year in which he ceases to be a regularly enrolled student. However, if he receives a degree in engineering he may, at his request, be transferred to Associate Membership without the payment of additional dues for that year. If request for transfer is not made by the end of the calendar year in which the degree is granted, application must be made as provided for in Section 1.

ARTICLE II — NOMINATION AND ELECTION OF OFFICERS AND DIRECTORS

Section 1. The President, subject to the approval of the Board, shall appoint a Nominating Committee consisting of five or more Members and Associate Members at least eight and one-half months prior to the Annual Meeting.

Section 2. The Nominating Committee shall be responsible for (a) selecting one or more nominees for .ach office (b) obtaining the consent of each nominee to serve if elected, and (c) securing biographical data of each nominee. The entire slate of candidates complete with biographical data shall be sent at least four and one-half months prior to the Annual Meeting to the Execuitve Secretary who in turn shall mail it to the membership at least four months prior to the Annual Meeting.

Section 3. Other nominations for any office may be made by a petition signed by at least ten Members or Associate Members and transmitted to the Executive Secretary, along with biographical data, at least three months prior to the Annual Meeting. The petitioners shall obtain agreement from the nominees to serve if elected.

Section 4. Election of Officers and Directors-at-Large shall be by sealed letter ballot.

Section 5. The official election ballot shall be mailed by the Executive Secretary at least two and one-half months prior to the Annual Meeting to each Member and Associate Member, who shall properly signify on it his choice for the various Officers and Directors-at-Large and transmit it to the Executive Secretary so as to be received by him at least one month prior to the Annual Meeting. Ballots received after the specified time shall not be counted.

Section 6. The President shall appoint two tellers to whom the Executive Secretary shall deliver, unopened, all ballots received by him within the specified time. The tellers shall count the ballots and report the results to the Board at least two weeks prior to the Annual Meeting. Those candidates receiving the greatest number of votes cast shall be elected. In case of a tie vote, the office shall be filled by the Board from among those tied for office. The out-going President shall see that the entire membership is advised of the results.

ARTICLE III. — DUTIES OF OFFICERS AND DIRECTORS

Section 1. The President is the chief executive officer of the Association. He shall preside at all business meetings of the Association and of the Board of Directors, and, in addition to any other duties specifically prescribed in the Constitution and By-Laws, shall be responsible for administering the affairs of the Association according to the policies and regulations established by the Board of Directors.

Section 2. The Vice-President shall act for the President whenever the President is unable to perform his duties; and he shall become President if that office becomes vacant. He shall also have overall responsibility for arrangements and conduct of the Annual Meeting.

Section 3. The Secretary, in addition to any other duties specifically prescribed in the Constitution and By-Laws, shall keep minutes of the meetings of the Association and proceedings of the Board of Directors, shall keep a roll of members, and shall be responsible for all official correspondence of the Association.

Section 4. The Treasurer shall collect and have charge of the funds of the Association and shall disburse the same only upon the authority of the Board of Directors. He shall report annually, or oftener if requested, and his accounts shall be audited annually by an Audit Committee appointed by the President.

Section 5. In addition to other duties herein prescribed, the Board of Directors shall meet at least twice a year on the call of the President or any five members of the Board. The Board shall have power to make such regulations, not inconsistent with the Constitution and By-Laws, as shall be necessary for the protection of the property of the Association, and for the preservation of good order in the conduct of its affairs. It shall also be the duty of the said Board to present business for the action of the Association. It shall have no power to make the Association liable for debts amounting to more than half of the amount in the Treasurer's hand, in cash, and not subject to prior liabilities. Each Director shall have jurisdiction over one or more Standing or Technical Committees of the Association, as delegated by the President, and shall be known as the Sponsoring Director of the Committee or Committees.

Section 6. With the approval of the Board, the Secretary and the Treasurer may delegate certain of their duties to the Executive Secretary.

ARTICLE IV. — COMMITTEES

Section 1. The Standing Committees of the Association shall include: (a) Admissions, (b) Awards, (c) Coordination, (d) Education, (e) Membership, (f) Planning, (g) Publication, (h) Publicity, and (i) Regional Section.

Section 2. Technical Committees shall be established by the Board of Directors, at its discretion, for the purpose of developing and publishing standard or recommended methods, forms, procedures, terminology, and data pertaining to Cost Engineering.

Section 3. It shall be the function of the Admissions Committee to consider all applications for membership and to elect to membership those applicants who meet the requirements.

Section 4. It shall be the function of the Awards Committee to select as recipients for an Annual Award of Merit an individual who has made outstanding contributions to the field of Cost Engineering.

This Committee shall also make recommendations to the Board for the establishment of any other awards which it believes would promote the objectives of the Association.

Section 5. It shall be the function of the Coordination Committee to coordinate the technical activities of the Association with those of other organizations having common or related interests.

Section 6. It shall be the function of the Education Committee to encourage the teaching of Cost Engineering in engineering schools.

Section 7. It shall be the function of the Membership Committee to promote membership in the Association.

Section 8. It shall be the function of the Planning Committee to consider the long range objectives of the Association and to determine the effectiveness with which the objectives are being met.

Section 9. It shall be the function of the Publication Committee to establish, with the approval of the Board, the policy to be followed in regard to the publication of papers presented at national and regional meetings, and to administer the policy that is established.

Section 10. It shall be the function of the Publicity Committee to inform the public of the activities of the Association.

Section 11. It shall be the function of the Regional Section Committee to encourage the establishment of regional sections, to consider all petitions for the establishment of regional sections, and to foster the general well-being of the regional sections.

Section 12. The chairmen of all Standing and Technical Committees shall be appointed by the President, subject to approval by the Board of Directors.

Section 13. The Chairman of each Standing and Technical Committee shall appoint the other members of his Committee, subject to approval of the Board or the Sponsoring Director of his Committee.

Section 14. Members of Standing and Technical Committees shall be appointed to terms of office, nominally one year, running concurrently with the terms of officers of the Association. Members of committees shall be eligible to serve any number of successive terms to which they are appointed.

Section 15. Standing and Technical Committees shall devise their own rules of procedure and adopt the same subject to the approval of the Board.

Section 16. Temporary Committees shall be appointed by the President, subject to approval by the Board. A temporary committee shall be discharged at the discretion of the President.

ARTICLE V. — REGIONAL SECTIONS

Section 1. Application for the establishment of a Regional Section shall be made to the Regional Section Committee by a petition signed by at least ten members residing within the boundaries of the proposed section.

Section 2. The application for recognition shall include the proposed title of the Section, regional boundaries, the proposed Constitution and By-Laws, together with such other information as may be directed by the Regional Section Committee. The Constitution and By-Laws of the Regional Section shall be in harmony with the Constitution and By-Laws of the American Association of Cost Engineers.

Section 3. Applications approved by the Regional Section Committee shall be transmitted to the Board of Directors for action. The Board may request additional information from the petitioners or the Regional Section Committee.

Section 4. The favorable vote by a majority of the Board shall be required for approval to establish a Regional Section.

Section 5. The Board shall notify the petitioners and the Regional Section Committee of its action.

Section 6. Such Sections as may be organized shall be identified by titles appropriately identifying the geographical regions to be served by the Sections.

Section 7. Recognition of any Regional Section may be withdrawn by the Board if, in its opinion, the Section is not serving the best interests of the Association.

Section 8. At its discretion, the Board may redefine the boundaries of any Regional Section.

Section 9. Regional Sections shall not commit the Association unless specifically authorized by the Board of Directors.

Section 10. Financial operations of a Regional Section shall be handled entirely within the Section.

ARTICLE VI. — MEETINGS

Section 1. Meetings of the Association shall be called by the President upon approval of the Board of Directors, or may be called by a majority of the Board of Directors.

Section 2. Notices of the time and place of each meeting, and general information shall be sent to all members. Such notices, except in case of urgency, shall be mailed not less than sixty days before the meeting.

Section 3. At any meeting any procedural question requiring parliamentary ruling not provided for in the Constitution or By-Laws shall be decided in accordance with Robert's Rules of Order, Revised.

Section 4. The order of business at every business meeting of the Association shall be:

1. Reading of minutes of preceding meeting.
2. Report of Board of Directors.
3. Reports of Standing Committees.
4. Reports of other committees.
5. Unfinished business.
6. New business.

The order of business at any meeting may be changed by a vote of the majority of the members present.

ARTICLE VII. — FINANCIAL

Section 1. Each Member shall pay annual dues of $10.00.

Section 2. Each Associate Member shall pay annual dues of $10.00.

Section 3. Each Student Member shall pay annual dues of $1.00.

Section 4. The fiscal year of the organization shall begin on January 1 and terminate on December 31. Annual dues shall be payable in advance of the first day of the fiscal year, and it shall be the duty of the Secretary to notify each Member on or before such date of the amount due for the ensuing fiscal year.

Section 5. In the event that the American Association of Cost Engineers should be dissolved for any reason, its assets — physical, monetary, or otherwise — shall be disposed of as follows:

1. All just debts and claims shall be paid from cash on hand, this not being sufficient, said assets shall be sold to pay all debts and claims.
2. Any remaining assets, for which there are not just claims or debts, shall be turned over, without any restrictions whatsoever, to the United Engineering Trustees, Inc., a non-profit scientific and educational corporation whose charter objectives are "the advancement of the engineering arts and sciences in all their branches and to maintain a free public engineering library".

ARTICLE VIII. — PROCEDURE FOR AMENDING THE CONSTITUTION AND BY-LAWS

Section 1. Proposals to amend the Constitution and By-Laws may be made by the Board of Directors or by petition signed by at least ten Members of the Association.

Section 2. Proposals made by petition of Members shall be submitted to the Board. The Board shall consider these proposals at its next meeting and inform the petitioners within sixty days thereafter that it: (a) favors the proposal as presented, (b) favors the proposal with suggested changes, or (c) is not in favor of the proposal.

Section 3. After the petitioners have been informed of the Board's opinion, they may withdraw their proposal or decide to submit it to a vote of the membership either in its original form or with the changes suggested by the Board.

Section 4. Proposals to amend the Constitution or By-Laws, whether made by the Board or by petitioners, shall be submitted to the Secretary who shall place the proposed amendment on an official ballot to be mailed by the Executive Secretary to all Members at the same time that the official ballot for election of Officers and Directors is mailed.

Section 5. Ballots shall be marked by the Members and returned to the Executive Secretary at least one month prior to the Annual Meeting. Ballots received after the specified time shall not be counted.

Section 6. The President shall appoint two tellers to whom the Executive Secretary shall deliver, unopened, all ballots received by him within the specified time. The tellers shall count the ballots and report the results to the Board at least two weeks prior to the Annual Meeting.

Section 7. The Board, through the President, shall declare adopted any proposed amendment to the Constitution that receives an affirmative vote of at least three-fourths of the valid votes cast, and any proposed amendment to the By-Laws that receives an affirmative vote of at least two-thirds of the valid votes cast.

Section 8. Amendments to the Constitution and the By-Laws shall become effective at the close of the annual meeting following their adoption.

ARTICLE IX. — EMBLEM AND SEAL

Section 1. The official emblem of the Association shall be of a shape and design as illustrated.* The official colors of the emblem shall be white or silver and a greenish gray.

Section 2. The official seal of the Association shall be of the same shape and design as the emblem but shall carry the words: "Founded 1956".

ARTICLE X. — NUMBERING OF ARTICLES AND SECTIONS

Section 1. Without changing their import, the Board may number and from time to time renumber the various Articles and Sections of the Constitution and By-Laws to facilitate ready reference.

ARTICLE XI. — AMENDMENTS

Section 1. The By-Laws may be amended by a two-thirds affirmative vote of Members as prescribed in Article VIII.

* AMERICAN ASSOCIATION OF COST ENGINEERS

AACE Election Results

Five hundred and twenty-eight ballots were cast in this very close race. Those elected will take office on July 2, 1962, according to the amended Constitution which is printed above.

President

Cecil H. Chilton 509*

Vice President

James H. Black 250

Donald I. Meikle 266*

Secretary

Thomas C. Ponder 505*

Treasurer

Wesley J. Dodge 281*

Sidney Katell 233

Directors

Carl C. Clayton 196

Harold J. DeLamater 281*

William I. McKay 286*

Marion W. Rodgers 273

Proposed Amendments to Constitution and By-Laws

	YES	NO
1. Do you approve of the modifications to Article II – Objects?	474	9
2. Do you approve of the Amendments dealing with the change in the term of office so that the term would be "from Annual Meeting to Annual Meeting?"	496	6

*Elected

Regional Section Directory

If you reside near one of the regional sections, contact the president so that you can benefit from the worthwhile activities of your region. If a business trip coincides with a meeting of a section outside your region, you are welcome to participate in any and all activities.

BRITISH

President — John H. Herbert, Kellogg International Corp., 7-10 Chandos Street, London, W.1, England.

CHICAGO — MIDWEST

Chairman — Harold F. Stamps, DeLeuw, Cather & Co., 150 North Wacker Drive, Chicago 6, Illinois.

DELAWARE VALLEY

President — Leslie C. Jenckes, Sun Oil Co., 1608 Walnut Street, Philadelphia, Pennsylvania.

GULF COAST

President — Arthur H. Weber, Tellepsen Petro-Chem Constructors, P. O. Box 2536, Houston 1, Texas.

METROPOLITAN NEW YORK

Chairman — Stanley A. Gertz, The M. W. Kellogg Co., 711 Third Avenue, New York 17, New York.

MONTREAL

President — C. Arthur Miller, Canadian Industries Ltd., P. O. Box 10, Montreal, P. Q., Canada.

NEW ENGLAND

President — Charles V. Keane, Metcalf and Eddy, 1300 Statler Bldg., Boston 16, Massachusetts.

NIAGARA FRONTIER

President — Richard G. Hopper, Uhl, Hall and Rich, P. O. Box 327, Niagara Falls, New York.

NORTHEAST OHIO

President — Harvey H. Huttenlocher, National Carbon Company, Inc., P. O. Box 6087, Cleveland, Ohio.

PITTSBURGH

President — Joseph F. Rigatti, Koppers Co., Inc., 3018 Koppers Bldg., Pittsburgh 19, Pennsylvania.

SAN FRANCISCO

President — A. L. Horstmeyer, Wm. Horstmeyer Co., 23 Mars Street, San Francisco 14, California.

SOUTHERN CALIFORNIA

President — Frank M. Russell, AETRON, A Div. of Aerojet-General Corp., 410 Citrus Ave., Covina, California.

National Committee Chairmen

Admissions

Carl C. Clayton
Pittsburgh Plate Glass Company
P. O. Box 4026
Corpus Christi, Texas

Awards

Dr. Bernard J. Gaffney
Wood Conversion Company
First National Bank Building
St. Paul, Minnesota

Bibliography

D. S. Mattiza
Pittsburgh Plate Glass Company
P. O. Box 4026
Corpus Christi, Texas

Capital Cost Control

Richard R. Balotti
E. I. duPont de Nemours and Company
Louviers Building
Wilmington 98, Delaware

Capital Cost Estimating

Egon F. Brummerstedt
Bechtel Corporation
62 First Street
San Francisco 4, California

Convention Arrangements (1962)

H. C. Thorne, Jr.
Amoco Chemicals Corporation
130 East Randolf Drive
Chicago 1, Illinois

Coordination

Elsie Eaves
Engineering News-Record
330 West 42nd Street
New York 36, New York

Cost Index

Glen W. Moorehouse
Tennessee Eastman Company
Kingsport, Tennessee

Education

Dr. James H. Boyd
250 Park Avenue
New York 17, New York

Membership

To be announced

New Sections

Paul A. Hesselgrave
General Electric Company
P. O. Box 254
San Jose, California

Operating Cost Estimating and Control

William J. Hegerty
The Colonial Iron Works Company
17643 St. Clair Avenue
Cleveland 10, Ohio

Planning

C. Arthur Miller
Canadian Industries Limited
P. O. Box 10
Montreal, P. Q., Canada

Profitability

H. C. Thorne, Jr.
Amoco Chemicals Corporation
130 East Randolf Drive
Chicago 1, Illinois

Publications

James G. Hoyt
General Electric Company
2151 South First Street
San Jose, California

Publicity

Daniel T. Brink
Corn Products Co.
201 North Wells,
Chicago 6, Illinois

Regional Activities

Wesley J. Dodge
Socony Mobil Oil Company
150 East 42nd Street
New York 17, New York

Technical Program (1962)

Warren W. Twaddle
Amoco Chemicals Corporation
130 East Randolf Drive
Chicago 1, Illinois